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REVIEW OF AFRICAN POTENTIAL FOR PRECIOUS AND SEMI-PRECIOUS STONE PRODUCTION

Summary

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PREFACE

The Third Regional Conference on the Development and Utilisation of Mineral Resources in Africa, held in Kampala, Uganda, from 6-15 June 1988 called for closer examination of small-scale mining of precious and semi-precious minerals. The Ministers noted a growing activity in many African countries, which faced many constraints, including the deprivation of substantial foreign exchange by illicit trade.

Consequently, the Ministers called for the Economic Commission for Africa (ECA) and regional institutions to organise seminars aimed at examining:

a) the full potential in Africa for the development of small-scale mining for precious and semi-precious minerals;

b) the current status of small-scale mining, both illicit or legal;

c) the legislative and fiscal regimes governing small-scale mining of precious and semi-precious minerals;

and, as a result recommend a strategy for a positive growth of small-scale mining for precious and semi-precious minerals, including legislative fiscal and technical aspects.

Towards this, the ECA presented a paper entitled "Enhancement of the Contribution of Precious and Semi-precious Minerals produced by Small Scale Mining Operations to the Economic Progress of Africa" at the Regional Workshop on the Enhancement of the Contribution of African Non-fuels Mineral Sectors Towards the Region's Economic Advancement, held in Harare, Zimbabwe, between 30 July and 3 August 1990.

The paper began by stating that "although Africa abounds in mineral resources" the exploitation is dominated by transnational corporations whose interests are remote from those of the region". In consequence, it was contended that African countries needed to "employ small-scale mining operations" to "generally increase production" and "thus enable them (indigenous miners) to establish themselves".

"Mining operations that are or may be both financially and technologically operated by unskilled indigenous people as well as the authorities" were singled out for special attention. The past five years had seen a marked increase in small-scale mining, especially for gold and precious stones, and there had been several conferences, seminars and workshops held in sub-Saharan countries, towards developing the drive in artisanal mining that could lead "gradually to a true restructuring of the production of precious and semi-precious minerals in the region".

However, the experiences are showing that, whilst artisanal mining provides a significant counter to the employment problem there are equally significant resultant problems. Illegal marketing, tax evasion and the uncontrollable impact on the environment were noted as being attendant in

most cases. Several countries were at various stages in the process of legislating for artisanal mining, but were finding it costly to establish the necessary technical assistance, as well as adequate production, financing and marketing structures.

In seeking ways to improve the "investment climate for small-scale exploitation" the paper went on to identify "the general mistrust for private operations" as well as the "discouraging" effect of high taxation and the limitations on "free export marketing" as being the reasons for foreign investor disinterest. "To allow private national and foreign investors to contribute positively to the desired increased production", it was necessary to create a "climate of confidence" with equitable taxation and royalty embodied in "simplified formulas that allow foreign investors to be the final target of their products abroad".

This review, which focuses on precious and semi-precious stones in Africa, begins with a brief historic background and presents an account of the recent trends in the gemstone industry in sub-Saharan Africa. The review also attempts to set out some of the salient aspects of the background to the world gemstone industry, with a view to providing an explanation for the prevailing market forces.

The review notes that the majority of production in Africa arises from successful relationships between some governments and the large-scale mining investor, whilest other observations point to the fact that the artisanal and small-scale miners need better links with the export markets in order to eliminate the incentives to smuggle. From these observations, the review goes on to make recommendations towards improving the contributions from production, as well as making indigenous initiative more competitive and rewarding.

This summary paper focussing on the small-scale mining aspects and recommendations for overcoming the constraints which are tending to limit both small and large-scale gemstone mining on the African continent is presented for consideration at the Technical Workshop preceding the Fourth Regional Conference to be held in Ouagadougou, Burkina Faso, from 18th to 27th March 1991.

I. REVIEW OF AFRICAN POTENTIAL FOR PRECIOUS AND SEMI-PRECIOUS STONES

1. Introduction

1. Until the beginning of the eighteenth century, the world supply of diamonds and the majority of other gemstones came from India.

2. However, the opening of the South African diamond mines in 1870 had an unprecedented effect on the number of large stones which became available from Africa.

3. By 1881, the operations at the Kimberley diamond fields, which had been fragmented into numerous 10m x 10m claims, had ground to a halt. Two of the small-scale miners, Rhodes and Barnato, realised the necessity for amalgamating all the interests and by 1887 their company, De Beers, had consolidated all significant producers. Their successor, Ernest Oppenheimer subsequently added the concept of the Central Selling Organisation, so that "out of Africa" was born the foundation of the global diamond industry of to-day.

4. In 1908, widespread paleo-alluvial diamonds were discovered along the southern shores of Namibia and by 1910 other alluvial resources had been detected in Zaire and Angola. Detailed exploration subsequently showed that these are the most extensive known alluvial resources in the world. In less than a decade the search went on to demonstrate that there were rich diamond fields in Ghana and even richer in Sierra Leone where, in 1945 a 770 carat stone was found on the banks of the Woyie river. A few years earlier J.T. Williamson had found his first rose pink diamond at Mwadui in Tanzania.

5. Because of the shallow nature and the perennial availability of water, it was in West Africa where the indigenous artisanal and small-scale miners were first able to participate in the exploitation of diamonds, by emulating the operations of the foreign investors. Large-scale mining got under way in Ghana in 1919 and one company, Consolidated African Selection Trust CAST, soon became the most important producer. CAST expanded into the neighbouring states, forming Sierra Leone Selection Trust SLST, Societe Guiniene de Récherches et d'Exploitation Minieres SOGUINEX and Watson's Ltd. in Côte d'Ivoire.

6. A feature of the post World War II period of decolonisation was a rapid increase in the supply from artisanal miners, followed by an equally rapid decline in official production in the 60's. After a surge in production in unison with prices during 1961-62, all countries nationalised their major producers, though frequently signing management agreements with the technical staff.

7. In Ghana, as a result of an influx of "strangers", exports from diggers rose from 68250cts (£0,74/ct) in 1945-46 to 914470cts (£3,68/ct) in 1951-52. Indeed by the time the Love-ridge Committee of 1949 realised the importance of small-scale diamond production there was a general inability and unwillingness to control artisanal digging. During the immediate post-independence period, both the large- and small-scale production prospered

even more. The surge in production from 1933 to 1960 was also facilitated by a highly satisfactory marketing system, which was provided by the Bank of British West Africa and Barclays Bank DCO. These banks acted as agents and financiers, receiving diamonds from the diggers, paying 50-90% of assessed value, and sorting and making up larger parcels which they sold by tender to the international market. Each miner was provided with the valuers price for his goods and his portion of the balance of the proceeds of the sale of the parcel. The banks received 7.5% commission and 6.5% interest on advance payments.

8. There were no complaints until over production in 1952 resulted in a decline in prices and, in 1954, pressure from diggers associations as well as growing nationalism, resulted in the foreign banks being replaced by the Accra Market. This was the first African based bourse in which diggers could sell their production directly to licensed international dealers, albeit under the supervision of a government valuer. Initially there were only three Licensed Buying Agents LBA's, however by 1961 the LBA's had been increased to eleven, representing all the diamond trading countries of Europe that were keen to obtain supplies independently of the CSO. The resultant competition produced such attractive prices that smuggling was non-existent and indeed diamonds were coming into Ghana from Sierra Leone and even Zaire.

9. As pricing structures became known the pressure groups began to home in on a commission and the Gold Coast Diamond Winners Association GCDWS was awarded a 1% rake off. Also the fag of travelling to Accra to sell led to middlemen buyers who held claims to legalise themselves. These middlemen provided the digger with an instant cash facility and were better at bargaining at the market.

10. Ultimately the ruling party saw diamond marketing as a source of funds and in 1963 formed the Ghana Diamond Marketing Board GDMB, which as the single buyer, at a time when prices were unstable, led to increased smuggling and the decision by the large-scale miner, CAST, to stockpile for two years. Indeed CAST even offered to be a buyer at the prices being quoted by the GDMB. Nevertheless, in spite of numerous objections and investigations into the GDMB, it was re-incorporated in 1965 and it was not until 1968 that the government returned to free trading. Indeed five methods of selling gemstones were approved, tender sales, sales by allocation, take-it-or-leave-it, opening Antwerp offices, and sales to local industry or the LBA's. By 1982 the Ghanain gemstone marketing system had been through the full cycle of every method and had ended up with India becoming the most important buyers.

11. A similar cycle from a market economy to centralised control and back to a market approach occurred in Sierra Leone. The 1954 "great rush" of 60,000 diggers of Kono, Bo and Kenema precipitated the Alluvial Diamond Mining Scheme ADMS, a licensing system which still forms the basis of the small-scale mining code of to-day. Under the ensuing pressure SLST concessions were reduced to one at Yengema and another at Togo. By 1956, a marketing monopoly had been awarded to the CSO whose subsidiary Diamond Corporation of Sierra Leone DICORSIL opened offices at Bo, Kenema and Kono and sent buyers to visit sites to buy up the official production of £15M. However, by 1958

smuggled production was estimated to be worth £35M compared to £11,8M official. This was considered to be due to the low prices offered by DICORSIL as well as a 7.5% export duty and a 12% margin, compared to Liberia where lower duty and a dollar premium offered substantial returns to the smuggler. Combined production also peaked with the 1961 surge in prices, but in spite of less government intervention the subsequent decline occurred because of a rapid depletion of resources.

12. By 1965, there were 25,000 legitimately licensed diggers operating under 23 chiefdoms. The system worked well, but the resources were being depleted at too fast a rate. During 1970, the government nationalised SLST, formed Diamond Mining Company DIMINCO and subsequently made several attempts to take over the marketing. This culminated in the 1974 introduction of another ten licensed buyers and the splitting of the marketing of the parastatal production between Jamil Said Mohammed and Jack Lunzer's Industrial Diamond Company. This ended the DICORSIL monopoly.

13. In Guinea, artisanal and small-scale mining was confined to the period from the mid-50's to the early-60's. Again some 18,000-30,000 "strangers" descended on the SOGUINEX concessions in late 1956. Eviction was also physically impossible and politically undesirable, indeed the diggers had their own political party. By 1959 their numbers had increased to 41,200 constituted by local people and a majority of others from Mali, Côte d'Ivoire and Sierra Leone. Only half were registered. Nevertheless, under the circumstances, SOGUINEX was obliged to cede the majority of its concession area and as a result a surge in production similar to the neighbouring states ensued until 1961. This peak production was followed by nationalisation and exchange control introduced at a time when SOGUINEX and other large-scale production was being marketed through the CSO, whilst most of the diggers output went out through Monrovia. In an attempt to control the smuggling, the BEKINA diggers co-operative was formed in 1957. All diggers were required to belong and in addition the state opened the Kankan Diamond Market; a copy of the Accra Market.

14. On a smaller scale, similar cycles of development took place in Côte d'Ivoire indicating that only a free market system was feasible.

15. As far as coloured stones production is concerned, Africa was a late starter. Up to the end of the nineteenth century most sizeable emerald came from the Chivor and Muzo mines of Colombia in South America, where the Incas had been mining emeralds for 5 centuries before.

16. Since that time both Zimbabwe's Sandawana and Zambia's Kafubu emeralds have been major sources of supply from Africa. Kenyan ruby and tsavorite together with widespread occurrences of amethyst, aquamarine, tourmaline, garnet and sapphire make Africa a very significant producer of precious and semi-precious stones. Griqualandite (tigers eye), malachite, morganite and a host of other gem mineral and ornamental stones complete the total suite.

17. By including some of the background to the gemstone industry in both Africa and the rest of the world, it is hoped that this review will assist opinion makers and administrators in Africa to steer developments towards effective exploitation of their respective national resources.

II. SUMMARY OF AFRICAN PRODUCTION COMPATED TO THE REST OF THE WORLD

18. During the past decade, world production of diamonds, along with the monetary systems, have undergone some fundamental changes. The introduction of the sliding exchange rate system alone produced a scenario in which consumers, in the hard currency countries of the northern hemisphere, suddenly found themselves with increased buying power, whilst the producers in the third world began to experience an increased demand, resulting in profits that had to be ploughed back into the increased cost of imported machinery or debt servicing.

19. Table 4 sets out the total diamond production from African countries, compares them with the main producing countries in the rest of the world and derives a world total for the years 1981-1990. The proportion of gem and cheap gem quality for each producer has been used to compute an estimated annual production of "Gem quality" for Africa, compared to the Rest of the World and these are combined to give World totals.

20. At the beginning of the decade the proportion of gem quality to total industrial and gem production was roughly 25%, of which a mere 2% were considered as "investment grade" diamond. At the end of the decade this proportion had risen, as a result of bulk opencast mining, to nearly 40% and 2% respectively, with the value of "investment grade" having increased as a function of increased rarity.

21. In terms of individual performance, production from Angola, which is circa 60% gem quality, tended to falter as a result of civil strife and then rebounded. On the other hand, the decade saw a surge in production from Botswana which has become the world's leading producer of gem quality, at 45% of total production.

22. In Namibia, where 95% of the production is gem quality, it has become possible to work increasingly lower grades of the resources along the shoreline and still sustain output at around the 1Mct/yr level.

23. Production from the Central African Republic and the West African states has tended to peak out at the limit of artisanal mining techniques to produce about 0.6 Mcts, of which an average of 66% has been gem and cheap gem.

24. South Africa, where a substantial proportion of production is from underground sources, has managed to sustain an output of between 9 and 10 Mcts/yr, of which 40% has been gem quality, whilst a virtual cessation of production from Lesotho was replaced by new production from Swaziland.

25. The output from Mwandui in Tanzania, where about 70% of stones are of gem quality, has dwindled whilst in Zaire production has more than doubled, mostly from artisanal mining of alluvials, but at an overall gem quality proportion of only 28%.

26. The net effect has been for African production to double with the quantity of gem quality rising from 4 Mct/yr in 1981 to 14 Mcts/yr in 1988.

27. Production in the rest of the world remained almost static except in Australia where the Argyle diamond mine, now the worlds largest single producer, was brought into operation. A large percentage of the 40% of gem quality are yellows and browns. These have had to develop their own sector in the market by being promoted as "champagne diamonds". The addition of this quality to the former average gem quality of the world production has resulted in a significant increase in yellow stones on the market since 1986.

28. The overall world production of diamonds has therefore risen from 39 Mcts/yr in 1981 to 92 Mcts (235%) in 1989 whilst the proportion accepted by the consumer as gem quality has increased from around 10 Mcts/yr to 35 Mcts/yr (350%).

Table 4

ESTIMATES OF AFRICAN AND WORLD PRODUCTION OF DIAMONDS

COUNTRY	81	82	83	84	85	86	87	88	89
ANGOLA	1400	1225	1034	920	625	200	750	850	1200
BOTSWANA	4961	7769	10731	12914	12635	13090	13208	15299	15252
C.A.R.	312	277	295	337	500	600	600	343	327
GHANA	836	684	340	350	650	557	436	225	134
GUINEA	38	40	40	40	112	120	121	129	190
LESOTHO	53	42	0	0	0	0	0	0	0
LIBERIA	336	433	330	240	400	300	350	300	100
NAMIBIA	1248	1014	969	931	940	1010	1020	938	904
SIERRA LEONE	305	290	345	420	400	400	360	300	300
SOUTH AFRICA	9177	9575	9656	9493	9707	10744	9488	9021	9467
SWAZILAND	0	0	0	17	21	39	33	39	30
TANZANIA	217	220	261	266	236	190	150	175	85
ZAIRE	7161	6164	11982	18459	19975	23122	19772	17885	17598
SUB-SAHARAN AFRICA	26044	26733	35983	44395	46201	50372	46288	45504	45587
GEM QUALITY	7233	6950	14680	17276	17784	18726	17715	17590	17999
AUSTRALIA	205	457	6200	5690	7059	29200	30000	35180	34791
BRAZIL	1089	530	530	750	1000	1000	1000	1000	1000
CHINA	950	1000	1000	1000	1000	1000	400	600	200
GUYANA	10	11	12	14	11	9	7	6	8
INDIA	16	13	14	15	16	12	15	14	100
INDONESIA	15	15	27	27	73	100	100	123	120
USSR	10600	10600	10700	10700	10800	10800	11200	1200	1100
VENEZUELA	490	493	279	272	198	145	170	143	150
REST OF WORLD	13375	13119	18762	18468	20157	42266	42900	49066	47369
GEM QUALITY	2596	2769	7785	7083	7942	17760	18142	17228	16893
TOTAL WORLD	39419	39852	54745	62863	66358	92638	89188	94570	92956
GEM QUALITY	9829	9719	22465	24459	25726	36487	35857	34818	34892

III. ORGANISATION OF THE INDUSTRY IN AFRICA

1. Production Structure

29. The organisational structure which prevails amongst small-scale miners in Africa has stood the test of time and is similar to the systems operating in South America. Indeed it is a labour structure which is often overlooked by policy makers. In Ghana the "tributors", usually "chiefs", control access to land by selling "tickets" at prices which have depended on yield, time and who owns the production. The "digger" who buys the "ticket" employs others to do the manual labour. The "digger" and his gang may then treat the ore themselves or sell it to a "winner" who may have to transport it away to water in order to carry out the recovery process. In Sierra Leone the "digger" means either the "claimholder" or "tributor" who employs an "arrangement master" to employ, equip and feed a gang of 10-20 manual labourers who work in teams of 4-5, whilst in Guinea the "masta" employs "tributors" in gangs of 5-10 to work his land or claim.

30. The digging mostly absorbs young rural manpower and migrants from countries with fewer mineral resources. Indeed very often the ethnic breakdown of concentrations of miners on both small- and large-scale operations are dominated by aliens. In some cases there are tribal affiliations like the Yorubas (Lagosians) who feature prominently in both production and marketing compared to the Nzimas and Akims who because of their resistance to "tributing failed to participate in mining. These examples are in contrast to the Mende in Sierra Leone who kept "strangers" out and carried out the exploitation themselves whilst the Kono formed their own political pressure group to protect their interests over their diamond resources.

31. It follows, therefore, that, in most cases, the initiative and the operational undertaking of small-scale mining is by "strangers". Consequently, as in the case of the large-scale foreign investors, there are invariably three forms of payment due by the miner. These are rent, royalty and "consideration money" (tax). In the mid-50's, Birim Valley rent was increased from £50 to £100/yr per land unit because when the Accra Market opened, royalties were not easily definable and were dropped. In the Bonsa area 6 pence per carat was credited to the "stool" (colonial government agent) by the bank with whom the diamonds were lodged, followed by a further payment of 2 shillings in the pound in lieu of "tax", once the sale was completed. In Sierra Leone "consideration money" payable to the "chiefs" varied according to the diamond prices, ability to pay, and "strangers" had to pay more. In the Mende and Bo areas "chiefs" and "land owners" collected considerable sums and severely restricted "strangers".

32. Many payments found their way into the "chief's" and administrator's personal accounts, instead of central government revenues. On the other hand, company revenues tend to end up in central government coffers. There was therefore a tendency to favour leasing to "diggers" rather than companies. "Chiefs" often favoured "strangers" who would in turn support them politically.

33. The tributing system seems more widespread in Africa than the wage payment system introduced during the colonial period. Indeed the land or claimholder favours the tributing system because it provides for an immediate source of cash when he sells the "tickets". Similarly the "digger" uses the tributing system as the basis of the production-task related employment of his gang. This way, there is built in security amongst the trust-selected gang, who are consequently self motivated and do not need management, whilst the "digger" is a free agent, working when and how he likes and able to sell his stones to the highest bidder.

34. The working conditions of most small-scale mining camps (rush areas) are abhorrent to all but the lowliest of African culture. The resultant health and social problems created by shanty towns, drunkeness, violence and money squandering as well as outbreaks of decease (STD, Malaria and malnutrition of illegitimate children), and damage to marshy land in worked-out riverine systems are horrifying memories through the centuries. There is no demand for welfare amongst the participants who are mainly interested in "making money to send home". Indeed in spite of large turnovers by many dealers and claimholders there is a strong tendency to invest outside of mining. Instead of buying machinery to improve output or form mining companies, the small-scale miners "goes home" to invest in agriculture to feed his growing family and domestic herd of animals, which he believes are his "assets".

35. Capital investment by the small-scale miner is about 12-20% per unit of production compared to his large-scale equivalent. This is because the small-scale miner confines his activities to relatively shallow gemstone resources. More important is the method of finance. The time honoured system of financiers supplying foodstuffs, tools and pumps, on condition that the output is sold to the financier, is the most prevalent. Surveys during the 70's of the distribution of revenue under these schemes indicated that 33% went to cover the licences, 33% to the financier and 33% to the diggers. Indeed only a small minority who work entirely on their own in family units benefit from their labours, especially those who form small licensed digger-dealer companies. However, few survive for very long before dissolution.

36. The efficiency of the small-scale miner is not very high. Detailed evaluation prior to exploitation is rarely undertaken and mining is usually confined to resources with no more than 3m of overburden. The method of sinking random pits amongst muck piles and large trees which cover equally viable ground are only capable of poor percentages of extraction. However, the most unsatisfactory aspects are in the 30-60% recoveries from the traditional treatment processes. The small-miner is often seasonal as an alternative to subsistence farming, or he is in it for "quick money" and seldom interested in making a career out of his activities.

37. For large-scale mining in the majority of Africa, the minerals in the ground are the property of the State and there are basically two systems of social contract between the miners and the respective governments.

38. On the one hand, in the market economy systems, indigenous and foreign individuals and companies are allowed in terms of existing laws or negotiated agreements to exploit and beneficiate the mineral resources, whilst on the other hand, in the centrally planned economy systems, all mining and beneficiation tends to be undertaken by the State.

39. Throughout Africa there are combinations and variations between these two extremes which have sought to optimise the benefits to the State, with varying degrees of success.

40. In the market economy system, the miner must provide the technology, take the risk of the pre-production investment, as well as be taxed on the profits, so that the host government can in turn develop the country and its people. Indeed there are usually tax rebates if the miners develop infrastructure and provide social services for their employees, which would otherwise have to be provided by the State.

41. Under the centrally planned economy type, the government is required to use loans or citizens taxes to provide the technology and take the risk of the pre-production cost. In this case, there is no one on whom taxes can be levied and so any surplus must be used to develop the country and its people. Inevitably not much is ploughed back into the mining operations.

42. The current status of production of precious stones in Africa tends to show that, where the market economy system is being applied to large scale diamond production, the respective states are benefiting substantially from the operations. Yet there are several cases where both precious and semi-precious stones resources have been thrown open, under the market economy system, where the state is not benefiting at all, because the proliferation of operators has become too large to administer.

43. In the majority of cases, where the centrally planned system has been applied in the form of parastatals and state corporations, to exploit the precious and semi-precious stones resources, the result has been dwindling output or a failure due to a lack of the profit incentive.

44. The profit motive is inherent in the market economy system and miners have to plan their operations so that they remain competitive with the rest of the world.

45. Consequently, more and more African governments are tending to turn to varying degrees of joint-venture with the private sector, for the organised exploitation and marketing of their precious stones resources.

46. One example, mentioned previously in this review, which springs to mind is the 50:50 joint ventures between De Beers and the Government of Botswana which is leading to the establishment of a fully integrated, Botswana based, diamond mining and beneficiating company. Another is the 50:50 joint venture between Aredor and the Guinea Government, which also enjoys World Bank participation.

47. In other cases the system obviates the necessity for the state to share in the risk, because of already established tax regimes. An example is to be found in newly independent Namibia.

48. As an incentive to mining development the Namibian government grants tax relief to new mines. Taxation is postponed until cumulative revenue from sales exceeds the combined cost of development and operations. Miners are therefore able to repay their loan finance and eliminate the interest burden at an early stage. In the case of existing mines, additional capital expenditure is allowable against tax in the year of expenditure. Taxable profit in the mining industry in Namibia is thus the balance left after the deduction of the operating and capital expenditure from the sales revenue.

49. It follows therefore that any state with an equitable tax system will automatically have a share in all existing and future mining, without necessarily being involved in the nuts and bolts of the operations.

50. There is however, no all embracing optimum investment code. Each precious stones resource in each country has its own set of circumstances. In addition, miners have their objectives and their track records.

51. In the final analysis, there are the usual laws of supply and demand and the desirability of healthy competition to fall back on for guidance in seeking to optimise a particular set of circumstances. Where the resource is of world significance, a stable government is able to choose from a number of appropriately skilled mining houses, with good global track records in fairminded and responsible resource management, to undertake the exploitation and mining. On the other hand, if the resource is viable but there are substantial logistical problems, the host government must expect to provide incentives to attract the appropriately skilled miner.

52. These qualifications are also applicable to small-scale miners. The exploitation of gemstone resources needs to be confined to miners who will conduct responsible and workman-like operations. Consequently, if gemstone deposits are to be exploited by small-scale miners, to the best advantage of the host nation, then there should be clearly communicated laws and regulations, together with an adequately policed administration, capable of enforcing the desired methods of exploitation.

53. If the nature of the deposit is such that it requires higher technology, or a scale of investment beyond the scope of small-scale miners, then, in the national interest, the task should be allotted to an appropriately experienced mining house, who will self impose internationally acceptable laws and environmental mitigation.

2. Equipment and Training

54. The equipment needed for mining precious and semi-precious stones ranges from hand digging tools and a screen to heavy earthmoving shovels and trucks capable of feeding millions of tonnes of rock per year to sophisticated, electronically controlled, recovery plants. In many parts of Africa the

artisanal and small-scale miners have come to the end of the resources that can be mined and treated with simple tools and equipment. As such there is a need for the importation or manufacture of the tools and machinery which will enable the small-scale miner to graduate to larger-scales of operation.

55. Governments can induce mineral development by providing schemes for acquiring equipment and undertaking training in the use of the items of equipment. Zimbabwe's plant hire scheme is an example where the provincial mining administration offices each have depots from which items of plant and equipment can be hired at a monthly breakeven charge derived from the original cost of the plant plus subsequent maintenance, administration and interest. Since independence the scheme has been confined to small-scale miners only.

56. Without exception, the miners need access to international markets for their equipment purchases and replenishments of spares as well as for their skilled staff and for their banking requirements. Consequently, any unreasonable monetary controls which deny this access will tend to drive them away in the direction of other more free enterprise oriented pastures.

57. The field where knowledge is most lacking and training is most needed is in the recognition of gemstone materials and being able to ascertain a market value. Basic mineralogy needs to be taught at schools and gemstone mineral specimens and their current market values need to be displayed at government mines department offices and advertised in the press.

58. More training needs to be undertaken in the fields of gemmology, and the cutting, polishing and marketing techniques for gemstones. Here there is no substitute for being able to learn from the traditional centres where the crafts were developed and consequently governments are best advised to sponsor study in these fields in Europe.

59. Skills training packages are becoming a common add-on in mining ventures by foreign investors. The old multinational approach, where first world based head offices controlled their "empires" by dispatching management on tours of duty, has given way to transnationals where the in-house technologies and management strategies and systems are imparted to indigenous managers and employees. In Africa, the transnational subsidiaries of the global mining houses are in the forefront of training Africa's future mining entrepreneurs.

3. Legislative Regimes

60. Illicit diamond mining IDM or buying IDB takes two forms namely mining and theft from other claimholders or mining on land without a licence. Illicit miners usually work at night on the richest zones, with simple portable equipment. There have been many attempts to control illicit miners and dealers by legislation but few have been totally successful without considerable additional expenditure on the necessary security and police force. In many instances the prevalence of illicit activity has been linked to the presence of "strangers" and governments have resorted to periodic purges of foreigners. Often, the apparent reduction in activity is more related to the resultant disruption of production than improved security.

61. The most effective legislative regimes are those which, in combination with a market which offers the miner a choice of dealer, draw the gemstone production into the official market, because it offers the best deal. Any significant differences in the legislative regimes covering gemstone mining and marketing from one state to the next will be used to advantage by dealers and result in smuggling.

62. Indeed the legislation in various parts of the world, which most affect the movement and consumption of precious and semi-precious stones are the customs and excise regulations, as well as the sales and value added taxes, of the respective producing and consuming countries.

63. Basically, these boil down to a triangular situation involving the producer, the manufacturer and the market.

64. In the first instance, the producing countries wish to prevent gem rough leaving the country of origin, without either beneficiation or being recorded as an export for which the requisite foreign exchange earning must be returned to the host commercial banking system.

65. A number of African countries have legislated to maximise the beneficiation of the gemstone materials they produce. The most equitable way of achieving this objective, without stifling preliminary iritiative during the early stages of development of gemstone resources, seems to be the placing of an export tax on the value of rough material exported, as opposed to allowing the higher valued cut and polished material to be exported free of any levy. Another option is to credit the miner with a substantial proportion, if not all, of the foreign exchange earned from the export of cut and polished gemstones, but not from the export of rough material.

66. In the second instance, the consuming countries, which have insufficient or no gem resources of their own, try to discourage their populace from importing luxuries like gemstones, by imposing duties and taxes on such commodities.

67. Certain conventions such as GATT and LOME provide for special concessions or exemptions from duties for raw materials and finished goods from developing countries. However not all African countries qualify and in other cases the exemptions are disqualified because cut and polished gemstones are regarded as luxury goods. It is important therefore for African countries, when negotiating bilateral trade agreements, to ensure that finished gemstones from Africa are not subject to duties or taxes on entry into the target market countries. If this is not done then the competitiveness of African goods in the market are unfairly handicapped to the extent of the value of the duties and taxes.

68. In the third instance, countries which have no gemstones resources of their own, but have large numbers of labourers skilled in the traditions of cutting and polishing, tend to facilitate the easy import and export of gemstone rough so as to be able to take advantage by adding value to the raw materials from other countries.

69. Africa has to face up to competing with such countries and the answer lies in legislation which facilitates the importation of state-of-the-art technology.

4. Fiscal Regimes

70. In the late 60's, during the haydays of the Sierra Leone ADMS, a study of the distribution of digger revenue revealed the following. Diggers, gangmaster and licence-20%; financiers and pump owners-10%; dealers-40%; Government Diamond office-10%; Government tax 12%. In contrast it was estimated that the illicit digger and sponsor received 35% and the dealers 65%. Most of the current fiscal regimes in Africa still reflect this sort of imbalance.

71. African governments should not tax the production of commodities let alone gemstones. Indeed, in many cases, premiums should be offered on the market price as incentives to produce exportable commodities such as gemstones. Equitable taxation and excise should rather be confined to profits and services. In this way the difference between the legal and illegal routes for gemstone production is minimised and the incentive to smuggle disappears.

72. During the process of cutting and polishing a gemstone into one of the modern shapes, approximately 60% of the original weight is lost as chips and dust. However, in producing a polished gem the original value of the fragment of rough is usually increased by between 5 and 10 times. This very significant addition of value during a relatively simple process that converts mineral fragments into sparkling jewels is the incentive that drives the gemstone industry of the world.

73. African needs to derive a larger share of the value being added by manufacturing countries to its raw gemstone production. Consequently, more gemstone markets are needed, where cutting and polishing businesses are also catered for, so that the miner can integrate with the manufacturer before the export stage and the host government fiscus is enhanced.

74. There are few commodities with as large a number of producers, manufacturers and dealers. Yet the same laws of supply and demand govern the fiscal regimes pertaining to gemstones as any other commodity. There are many instances in Africa's mining history where valuable shallow resources have been descended upon by thousands of uncontrollable diggers resulting in over production and a fall in prices.

75. Given that the producers do not exceed the off-take of the dealers and the manufacturers stocks do not build up, the whole industry "ticks over" on a self financing basis, with a positive cashflow. If there are sudden surges in supply or drops in demand those involved in the particular sector of the industry tend to "club together" to form cartels to absorb the increase in stocks in order to protect the value of the stocks they already hold.

76. The largest of these cartels, in the case of diamonds, is the Central Selling Organisation (CSO) owned by De Beers. In turn the CSO has a subsidiary, the Diamond Trading Company (DTC). The CSO currently has agreements with producers, besides the De Beers mines themselves, to take agreed quotas of production of rough diamonds which amount to 80% of the world's production. After sorting and grading these portions of the world production, the gem diamonds are combined into sized and graded parcels and passed on to the DTC for sale to the manufacturers. The DTC have a clientele of more than a hundred "sight holders"; cutting and polishing merchants who are periodically offered parcels according to their requirements on a take-it-or-leave-it basis. The DTC names the price and if the sight holder passes too many opportunities to take-up the offer, then he does not get invited back. Besides the South African equivalents, De Beers have already established a further sorting house in Botswana and a cutting and polishing facility is to follow. This needs to be the trend in each regional trade community in Africa, that is producing significant quantities of gemstones.

77. In the case of coloured stones, the fiscal systems are supported by scores of smaller cartels operating along more or less the same lines but on a less formal basis. These coloured stone cartels tend to be specialists in particular varieties of stone and are centred around the freeports and main banking centres of the world, such as Hong Kong, Singapore, Bangkok and Geneva. In addition there are smaller centres around the world which are generally the main centres closest to the sources of the coloured stones. Examples are Bogota, for emerald, Rio de Janeiro for Brazilian gemstones or Adelaide for opal. Gemstone bourses on the African continent need to be established and allowed to compete with the freeport havens where the traditional coloured stone dealers are already based.

78. In each case the operative fiscal regime relies on the steady equilibrium between supply and demand to finance the most competitive flow of goods on to the market and thus sustain the respective governments' tax revenues.

IV. CONSTRAINTS AFFECTING THE DEVELOPMENT OF PRECIOUS AND SEMI-PRECIOUS STONES IN AFRICA

79. Subject to various political settlements, Africa has the resources to sustain current outputs of gemstones well into the next century. In certain cases depleted operations will need to be replaced with new production units, however there is plenty of scope for increasing production in line with any increases in demand. There is however a lack of encouragement in many states and this needs to be replaced with incentives.

80. There is even more scope for Africa to increase its share of the end value of its existing rough gemstone production. Where are the constraints?

1. Production

81. One of Africa's major constraints affecting gemstone and mineral production in general is the poor transport network.

82. Though gemstones are amongst the few mineral commodities, the exploitation of which can be mounted in remote areas, significant and competitive scales of operation must have reasonable access to appropriate machinery and consumables. The extreme remoteness of some of the resources in Africa tends to be one of the major constraints inhibiting production. The use of aircraft can assist but "at the end of the day" the development of roads are therefore important steps in promoting exploitation.

83. Power and water supplies are in many cases a constraint to the production of minerals. Power can be generated but the fuel supplies require roads.

84. The lack of equipment is the second major constraint standing in the way of the expansion of small-scale gemstone mining.

85. Much more needs to be provided for the importation or manufacture of small-scale mining equipment such as hoisting, pumping, excavating and transporting machinery, equipment and mobiles. To provide the small-scale miner with the facility for acquiring the equipment and machinery most suited to his needs and which he finds to be reliable, he must be allowed to make his own choices.

2. Utilisation and Trade

86. The major constraint standing in the way of an expansion of the utilisation and trade in gemstones is the almost complete lack in many producing countries of a "market place".

87. African utilisation and trade in its output of polished gemstone is very limited and needs to be increased. On the other hand the convertibility of gold and gemstone rough into hard currency is often the major incentive for the production of these commodities in Africa.

88. In the absence of formal marketing channels, the small-scale producer, in a remote area, often has no option but to sell to the only demand which exists on the spot, when he wants currency for the purchase of provisions. In many cases, it is either a case of, sell on the spot to an illicit dealer or face a journey of several 100 kilometres to the government marketing offices.

89. If African countries which produce precious and semi-precious stones wish to increase their share of the value being added to the material being mined in their countries, then they have got to follow, more closely, the pattern of utilisation and trade of the traditional "first world" industry.

90. If there were bourses or banking systems in countries which are gemstone producers where miners and foreign buyers could deal in gemstones, it would offer an alternative to illicit smuggling.

91. In those African countries where minerals marketing systems are still highly centralised more use should be made of the intake of gemstone production. Banks are already equipped with all the necessary security and accounting systems to be able to handle gemstones. Given the right incentives, the banks are able to employ the requisite expertise and to trade competitively against each other to give the miners the best international deal for their gemstone goods.

92. Once the apropriate trading for rough has been established, the usual natural extension is cutting, polishing and manufacturing by local entrepreneurs.

3. Legislative

93. Crushingly, punitive currency legislation is a major constraint stifling the development of Africa and gemstone production is but one of the activities that could be emancipated for the common good of the continent.

94. If there is free convertibility of gold and gemstones in and out of currency, in the main trading centres of the world, it follows that any other localities with laws which limit or interfere with such convertibility will be disadvantaged as a trading centre.

95. The currency restrictions in African countries are a major constraint to the development of a significant gemstone trade. The politicians and governments of some African states are beginning to appreciate this by allowing miners to retain significant percentages of the foreign exchange earnings they produce, in order to import mining machinery. These concessions, welcome as they are, are nevertheless a far cry from the free trading conditions prevailing in the main centres of the world, against which African entrepreneurs must compete.

96. It is therefore vital that legislators in Africa realise that the producers of gemstones require facilities where they can trade directly in hard currency with the international buyers. Miners who are credited with the best hard currency price they have been able to get for their production will not smuggle to some alternative, potentially longer, cashflow route. Furthermore, the true indigenous "diggers" and "winners" of African gemstones are African nationals and, all be they "strangers" from neighbouring states, they will recycle their foreign exchange back into the economy of Africa, as opposed to Europe, the USA and the Far East, who are currently benefitting as this review has hopefully demonstrated.

4. Fiscal

97. Africa's major constraint is that it does not have a strong enough convertible currency of it's own. The Afrodollar is still a dream which regional trade commissions in Africa need to work towards.

98. During the last decade, since the introduction of the sliding exchange rate system, currency volatility has increased, with profound implications for the success or otherwise of many mining operations and the beneficiation of mineral products.

99. Domestic currency weakness has, in many under developed countries, kept mines operating, whilst at the other end of the spectrum the holders of stronger currencies like the Yen and Swiss Franc, have been able to buy ever cheaper top quality gems. This is the reason why the Japanese demand for diamonds has been so strong and it is the same reason why many mines in Africa cannot afford to buy new equipment or even the fuel to sustain production.

100. In other ways, the effects of currency movements can have more impact than almost any engineering, trade of legislative parameter. For instance, whilst mining in weak currency areas may produce good profits in local terms, these may not be competitive returns to foreign investors when converted back into the original investment currency.

101. The outcome of this situation seems to be cycles of recession moving progressively to a situation in which only the high quality resources can be exploited.

5. Summary of Conclusions and Recommendations

102. Having reviewed African gemstone production and examined the structure and market forces, it is to be hoped that this review has demonstrated to the opinion makers in Africa that there are several tiers of the economy through which the worker or entrepreneur of the continent's resources must ascend, in order to reach the market place. Each tier takes a cut out of his initiative. Given that the miner is successful and has something to sell, it follows that he will seek out the nearest best price for his goods. These fundamentals form the basis of the recommendations.

1. Legislative and Fiscal

Marketing facilities

103. Governments and regional trade communities in Africa are advised to develop bourses or commission commercial banking networks to provide marketing facilities for small-scale gemstone miners, in order that they can deal directly with a choice of international buyers. Systems should be designed to eliminate "middlemen" or any revenue advantage to be gained by smuggling to an adjacent state. As such, common legislation and fiscal regulations amongst regional communities are recommended.

Currency of transaction

104. As the prime producer, it is recommended that the small and large-scale producers of gemstones be allowed to retain, within the commercial banking system of the host country, 50% of the foreign earnings from the export of rough gemstones and 100% of cut and polished goods. Such foreign exchange

retentions should be allowed to be spent by the producers on the imports of anything which can contribute to the development of the country and not just mining machinery. For those who have invested from outside of Africa, a portion of the foreign exchange earning, equivalent to 110% of the ruling prime interest rate of the country of origin of the investment, should be allowed to be remitted annually, provided the mining operation has made a taxable income in terms of the host country fiscus.

Taxation and Export Duty

105. Bearing in mind that the gemstone producer of Africa is competing with the free-markets of the world, it is recommended that the tendency amongst fiscal planners in Africa to "milk" the "luxury good trade" should be resisted. The local and regional fiscus should rather wait for the profit stage of primary raw material production before taxing the economy. Indeed, it is the "value adders" and the "service providers" who can be taxed once a constant stream of production is established and the economy is "ticking over". Export duties are disincentives that should be scrapped in favour of value add incentives.

2. Infrastructural Facilities

Transportation

106. Standing in the way of significant expansion of small and large-scale mining development in Africa, is the poor transportatioin network. It is recommended that 200% of certified expenditure on road and bridge construction be allowable against taxable income from mineral exploitation. In this way remote resources that are currently being ignored can become more competitive and contribute towards the planned opening up of the gemstone resources of the continent as a whole; especially if regional trade communities can integrate these developments.

Administration

107. Governments need to use their mineral resource administrations to educate the indigenous miners about the known occurrences of gemstones in their countries and advertise the production to the international market, rather than relying on the dealers to come searching for goods. Furthermore, it is recommended that the administration either provides or contracts expertise to undertake initial training amongst school leavers for roles in the gemstone trade including mining, treatment, manufacturing and marketing.